

The impact of electronic payment methods on monetary policy management

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Abstract

The significant development of information and communication technology has led to the emergence of a new concept in economics: the "digital economy," which has given rise to advanced forms of banking known as "electronic banking." The spread of electronic payment systems and methods has also affected the central bank's responsibilities in managing monetary policy. This research paper, therefore, examines the impact of electronic payment systems on the implementation of economic policy, with reference to Algeria. Among the most important findings regarding the potential effects of electronic payment methods on monetary policy, we find that, from a theoretical perspective, there are several effects, most of which center on the impact on the most essential function of the central bank, which is the issuance of currency and the increase in the money supply within the state. In practical terms, however, based on the Algerian banking sector, we have not reached a clear conclusion on the extent of the impact of electronic payment methods on monetary policy in Algeria.

Keywords: electronic payment methods, electronic payment systems, electronic money,

JEL Classification: G21, G22

ملخص

لقد أدى التطور الكبير لتكنولوجيا المعلومات والاتصالات إلى بروز مفهوم جديد للاقتصاد "الاقتصاد الرقمي"، مما أدى إلى ظهور صور جديد ومتطورة للعمل المصرفي تسمى "الصيرفة الإلكترونية"، كما أن انتشار نظم ووسائل الدفع الإلكترونية كان له أثر على قيام البنك المركزي بمسؤولياته في إدارة السياسة النقدية، لهذا قامت هذه الورقة البحثية بدراسة أثر أنظمة الدفع الإلكترونية في تفعيل السياسة النقدية بالإشارة لحالة الجزائر، ومن بين أهم النتائج المتوصل إليها حول الآثار المحتملة لوسائل الدفع الإلكترونية على السياسة النقدية فنجد من الناحية النظرية عدة آثار تتمحور جلها في التأثير على أهم وظيفة للبنك المركزي وهي الإصدار النقدي وتفاقم حجم الكتلة النقدية داخل الدولة، أما من الناحية الواقعية وبالإسقاط على الواقع المصرفي الجزائري لم نصل لأي نتيجة واضحة تبين لنا مدى تأثير وسائل الدفع الإلكترونية على السياسة النقدية داخل الجزائر.

الكلمات المفتاحية: وسائل الدفع الإلكترونية، نظم الدفع الإلكترونية، النقود الإلكترونية.

1.Introduction

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The significant development in the use of information and communication technology has led to the expansion of e-commerce, as well as the development of appropriate payment systems and methods, where money has begun to lose its physical and tangible form to appear in the form of flows, numbers, and electronic messages, which is known as electronic money. The emergence and use of electronic funds have raised many questions about their nature and characteristics, and whether they are truly capable of performing all the functions of traditional money. Another important question concerns the potential impact of its widespread use on the central bank's monetary policy. Hence, the research problem is defined by the following fundamental question: "Do electronic means of payment have an impact on monetary policy management?"

Importance of the research

The importance of this research lies in its addressing a vital topic that has not received its fair share of attention in academic and research institutions, nor even among decision-makers. This is evident in the lack of studies and statistics that address the impact of electronic payment methods on central banks' performance in managing monetary policy.

Research Objective

Through our study, we seek to achieve several objectives, the most important of which are:

- The theoretical rooting of the concept of electronic payment methods, their characteristics, and types;
- To present the impact of electronic payment methods on the functions of central banks in managing monetary policy;
- To examine the impact of electronic payment methods on the performance of the central bank in managing monetary policy in Algeria.

Research methodology: To study the research problem, analyze its dimensions, and understand the various aspects of the topic, we relied on a descriptive analytical approach in our study, as it is appropriate for the nature of the topic under study, through the description and analysis of its various axes, which are:

- Basics of electronic payment methods;
- The impact of electronic payment methods on the functions of central banks in monetary policy management;
- The impact of electronic payment methods on monetary policy in Algeria.

2. Basics of electronic payment methods

In light of the widespread use of technology across sectors and the proliferation of e-commerce, it has become necessary to develop modern, instant payment methods that align with e-commerce and meet customers' desire to purchase immediately after making a decision. Numerous payment methods have emerged for making purchases and completing sales, including online payments for goods or services. The most important of these methods is reviewed below.

2.1 The concept of electronic payment

Electronic payment is defined as: "The process of transferring funds, essentially the price of a good or service, digitally, i.e., using computers and sending data via a telephone line, network, or any other means of data transmission (Nazem Muhammad Nouri al-Shimari, 2008, p. 25) This is the concept of electronic payment. As for the means of this payment, they are defined as those that enable their owners to fulfill their financial obligations remotely via public communication networks. The success of e-commerce depends on the availability of payment and settlement methods and systems that are compatible with its nature and requirements.

2.2 Characteristics of electronic payment methods

Electronic payment methods differ from traditional payment methods in several ways, which we summarize as follows:

2.2.1 Electronic payment methods are international: they are accepted worldwide

and used to settle accounts in transactions conducted electronically between users. Electronic payments are made using electronic money, which is a monetary value stored on a card with digital memory or on the main memory of the institution that manages the exchange process. This method is used to settle remote electronic transactions in which the contract is concluded between parties who are geographically distant from each other, and payment is made via the Internet. i.e., across distances by exchanging electronic information via wireless communication. A payment order is issued based on electronic data that enables direct communication between the two parties to the contract. (Hussein, 2007, pp. 102-103) Electronic payment is made in one of two ways:

- First method: Through money allocated in advance for this purpose, payment is made via the Internet by exchanging electronic information using wireless communication methods. Therefore, payment is not made after this amount is deducted, and other transactions cannot be settled except by this method.
- The second method: through regular bank cards, where there are no amounts allocated in advance for this purpose, but rather the quantities withdrawn using these cards can be withdrawn by other means, such as checks, to settle any financial transactions. This requires a banking system designed to support it, i.e., the availability of devices that manage these remote operations to facilitate transactions between parties and build trust. Electronic payments are made through two types of networks:
 - The first type: a private network whose communication is limited to the contracting parties, and this is limited to the existence of prior commercial and financial transactions and relationships between them;
 - Type 2: A public network where individuals interact without any prior specific links between them.

2.2.2 Electronically stored value: This means that electronic payment methods include monetary units with financial value. Unlike regular legal tender (printed money), payment methods are encrypted data stored or loaded onto electronic media, such as plastic cards or personal computer memory. It follows that telephone cards are not considered electronic payment instruments, as the value stored on telephone cards is in the form of telephone units linked to a specific period of time and does not have a monetary value capable of purchasing goods and services. It also follows from the above that charging the

cash value electronically to a plastic card or to the personal computer of the cardholder (holder) of the electronic payment method, and that this is what distinguishes the latter from legal tender or credit, which are minted or printed monetary units.

2.2.3 Widely accepted by others than the issuer: Section 3/1 of the UK Financial Services and Markets Act stipulates that electronic money "is accepted as a means of payment by persons other than the issuer (Mohammed, 2015, p. 159) It is understood from the above text that electronic means of payment must be widely accepted by the public and institutions other than those that issued them, as their use should not be limited to a specific group of individuals, a specific period of time, or a specific geographical area. For money to be considered money, it must be accepted and trusted by individuals as a valid means of payment and a medium of exchange. On the other hand, some argue that these means cannot be considered electronic money if the source and recipient are the same person. For example, phone cards are not considered a means of electronic payment, given that the issuer and recipient are the same person—the telephone company—and that these cards can only be used in phones designated by the telephone company. In addition to the above, these means are easy to use due to their light weight and small size, and are therefore more practical than cash, as they exempt the person from carrying large amounts of money to obtain certain goods or services (Sharif Mohamed Ghanam, 2003, p. 117).

2.2.4 Two-dimensional: This feature means that both consumers and merchants can use it in their transactions, as it provides benefits and advantages to both merchants and consumers (customers) on an equal footing. Electronic payment methods Valid for financial clearance, as it is a means of fulfilling the obligations of a specific person, even if the other contracting party is not in the same place as the first contracting party using these means, or even if both contracting parties are in the same place.

2.3 Advantages of electronic payment methods

Electronic payment methods offer numerous advantages in terms of how payments are made and the nature of the entity carrying out the transaction, as well as the speed, efficiency, and security achieved through the use of these methods, as explained below

2.3.1 Method of performance (payment): The issue of making financial payments by electronic cards or other electronic means has become a reality in commercial transactions conducted through modern communication channels. These means are used to pay for services or goods obtained by the cardholder at all commercial establishments, or through the conclusion of electronic contracts. They are used instead of immediate cash payment, and the method of performance here is not necessarily restricted or linked to the payment of a specific amount from one contractor to another. Instead, all that is required is that the holder of an electronic payment method, if they wish to conclude a specific contract, may do so without paying an immediate cash amount. Still, the electronic method will replace the direct payment to the party who will receive their right.

2.3.2 Payment: The parties involved must have a financial system in place that allows for electronic payments, i.e., devices that manage such remote transactions, which will instill confidence in users of this type of payment method. Banks or other financial institutions must perform this role, but only if there is a prior agreement between the financial institution providing the electronic payment means and the person using this means. Therefore, the fulfillment system

here is based on finding a means of fulfillment that avoids direct or cash transactions, as the intermediary manages the fulfillment process on behalf of customers and suppliers and settles the debts and rights arising from their transactions.

2.4 Speed, efficiency, and security: Electronic payment methods provide speed in transferring assets from the account of an ordinary person to the account of the person they are dealing with without presenting any actual paper money, which provides great convenience to people in their work. This provides customers with a comfortable environment as they do not have to wait in line to receive cash directly and physically from financial institutions. In addition to the above, the use of electronic payment methods enables quick, secure transfers of funds between consumers and suppliers without exposing them to the risks of carrying large amounts of cash. Some say that the purpose of using this technology is to prevent the hacking of data exchanged over the Internet or other modern means of communication, and to prevent its illegal use by others in a manner that harms the parties involved. Under these means, the parties to the transaction can transfer the electronic value from one electronic wallet to another, thereby enabling the debtor to fulfill the obligation as soon as the electronic codes are assigned. And the recipient of this payment in an electronic wallet can convert it into real money through the financial institution that issued it.

2.4 Types of electronic payment

Electronic payment systems have been developed to enable the purchase of goods and services online. Electronic payment systems include contactless payment systems, digital payment systems for accumulated balances, stored value payment systems, and digital verification payment systems. The following is a detailed overview of these systems (Alaa Al-Hamami, 2016, pp. 355-357):

2.4.1 Micropayment: These systems were developed for purchases worth less than \$10 (such as articles, videos, music, etc.), which are too small to pay for with traditional credit cards.

2.4.2 Digital payment systems for accumulated balances: These give users the ability to make small purchases and payments on the Internet, accumulating to the balance they must pay regularly on their credit cards or phone bills. This system has been widely adopted by online music sites that sell music tracks for 99 cents.

2.4.3 Stored value payment systems: These enable consumers to make direct payments to merchants and other individuals based on the value stored in a digital account. Stored value systems rely on the value stored in the consumer's bank account, instruments, or credit card account, and some require a digital wallet.

2.4.4 new system called web-based peer-to-peer payment has quick solutions in serving people who want to send money to manufacturers or individuals who are not willing to accept credit card payments. The team sending the money uses credit cards to create an account with a special payment on the website dedicated to peer-to-peer payments. The recipient receives the payment by visiting the website and providing information about where they want the money sent (bank account or physical address). PayPal has become a popular peer-to-peer payment system.

2.4.5 Digital check payment systems, such as Western Union Money Zap and e-check, which extend the functions of checking current accounts so that they can be used for direct payment for marketing. Digital checks are cheaper than credit cards and much faster than paper checks. These checks are digitally signed and can be verified and used for e-commerce payments. Electronic check systems are helpful in business-to-business e-commerce.

2.5 Types of electronic payment methods

In this section, we will examine the types of electronic payment methods and the characteristics that distinguish each, as they are the latest form of payment accepted by banks and insurance companies.

2.5.1 Electronic money

Electronic money is not so much a new type of money as a new way of managing money, in which the value of a given monetary unit is equated with a digital or electronic unit, which is a new form of electronic payment.

– The concept of electronic money

Several definitions of electronic money have been proposed. It has been defined as an electronic means of paying for goods and services. Another definition describes it as the monetary value of a currency issued electronically by the public or private sector and stored in an electronic device. It can be considered a digital financial instrument that performs some or all of the functions of regular currency (paper money and coins). These units can be used to complete financial and commercial transactions online

2.5.2 Electronic payment cards

Electronic payment cards are defined as a contract between the card issuer, which is often a credit institution, and a person called the cardholder. Under this contract, the issuer undertakes to place at the cardholder's disposal a credit limit up to a certain amount, which can be used to pay for purchases at merchants who are also bound by a contract with the issuer, whereby the latter agrees to accept payment by card for a specific period of time (Al-Qilubi, 2004., p. 82). Given the variety of electronic payment cards issued by banks, it is necessary to clarify their types as follows:

– **Credit cards:** There are several names for credit cards. Some people call them electronic payment cards, plastic cards, credit cards, or charge cards. Still, the term credit card is the most common because, in addition to being a cash alternative, they provide the holder with short-term credit (as long as the payee does not receive immediate cash payment for the goods or services provided). The most well-known credit cards are Visa and Mastercard (Al-Zaydi, 2004, p. 80).

Credit cards are also known as guarantee cards (or surety cards). When a bank issues one and gives it to one of its customers, it declares that it is the guarantor and that the cardholder benefits from this guarantee from the moment it is issued. When it is issued, the customer is not required to use it to purchase goods and services, but may obtain it without planning to use it for purchases, instead taking advantage of this guarantee when needed. The card has one original purpose: guaranteeing (Sadek, 2019, p. 289). Therefore, credit cards are granted based on a special contract between a financial institution that facilitates credit and an individual. Under this contract, the institution opens a credit line for a specified amount. If the cardholder wants to purchase a product or obtain a service from a field approved by the issuing institution (Shafiq, 2020, p. 11), they present the card

to the institution, which settles the transaction and then recovers the amount from the cardholder in accordance with the terms of the credit agreement, the transaction and then recovers the amount from the cardholder in accordance with the terms of the credit agreement (Alexandria, 2001, p. 34)

- **ATM cards:** These cards allow the holder to withdraw cash from their account up to an agreed maximum amount through special machines where the customer inserts their card into the ATM, which asks them to enter their PIN. If the PIN is correct, the machine prompts them to enter the amount they need using the keypad. After the withdrawal, the customer automatically receives their card, and the amount is recorded on the debit side of their account (online).

- **Check guarantee cards:** Under these cards, the issuing bank guarantees its customer the payment of checks issued by the customer from that bank in accordance with the terms and conditions of the card issuance. The card contains the customer's name, signature, account number, and the maximum amount that the bank undertakes to pay for each check issued by the customer. The customer presents the card to the payee and signs the check in the payee's presence. The payee writes the card number on the back of the check and verifies that the card is valid. Suppose these conditions are met, especially the issuance of the check in accordance with the maximum limit allowed, the writing of the card number on the back of the check, and the validity of the drawer's signature. In that case, the drawee bank is obligated to pay the amount of the check to the beneficiary, regardless of whether it has sufficient funds. Hence, these cards provide a high degree of security for merchants by ensuring that the bank will pay the amounts due to them under the checks presented.

- **Loyalty cards:** Loyalty cards allow the cardholder to pay for goods and services obtained from certain stores approved by the card issuer. Payment is made by transferring the value of these goods and services from the cardholder's account to the merchant's account. This amount is transferred to the merchant as soon as the data for transactions made with the card is sent to the merchant's bank. The authorization period varies depending on the communication method between the merchant and the issuer.

Accordingly, there is a difference between a debit card and a credit card: the issuer of a debit card only settles the purchase if the cardholder has a credit balance and therefore does not provide the cardholder with real credit. This is unlike a credit card, where the issuer makes payments under credit facilities established for the cardholder.

- **Smart card:** This is a plastic card with specific specifications and standards set by the ISO organization. The card contains an electronic chip with a microprocessor that allows money to be stored through security programming. This card can interact with other computers and does not require authorization or confirmation of its validity to transfer funds from the buyer to the seller. The processors in smart cards can verify the integrity of each transaction against fraud. When the cardholder presents their card to the seller, the microprocessor in the seller's electronic cash register verifies the smart card's presence by reading the digital signature stored in the card's processor (Shaheen, p. 522).

Some people compare these cards to mobile computers because they actually store the cardholder's data, including information such as existing balances, banking limits, personal data, and PINs. This type of card has several features to protect against forgery and misuse by third parties in the event of theft, loss, or attempted counterfeiting, the

most important of which are the magnetic strip, the customer's photograph, the PIN, and the inability to open the outer cover.

– **Mondexcard**

International organizations have introduced a new payment card called "**Mondax**." It is the latest global payment system available to bank customers. It consists of a card with an electronic chip that stores information like a small computer, making it very flexible to use. It combines the advantages of paper money and modern payment cards while avoiding their disadvantages, as it can be used as a credit card or a debit card according to the customer's preference and is easy to manage bank-wise, as the customer cannot use it for more than the balance recorded on the card's electronic chip. It also allows transactions between holders of this type of card without visiting bank branches, as transfers can be made from one card balance to another via ATMs or on regular or mobile phones, facilitating commercial transactions and opening up a secure space in the market for financial transactions.

2.5.3 Electronic check

The electronic check is the most commonly used form of commercial paper for settling e-commerce transactions, as this method of electronic payment has been adapted to this type of transaction by creating a digital counterpart to paper checks (Herif, 2000, pp. 85-86)

An electronic check is essentially a virtual model of a paper check, containing the same data as a traditional check, such as "the amount, date, payee, drawer, and drawee." The latter must be an electronic bank that provides Internet banking services. All signatures on this check are electronic or digital signatures, forms of encryption that enable documents to be signed electronically and allow the recipient to verify the sender's identity. Electronic signatures are used to sign electronic checks, contracts, and other documents (Bassiouni, 2004, p. 78)

An electronic check is a secure, authenticated electronic message sent by the check issuer to the check recipient (bearer) for endorsement and presentation to the bank operating via the Internet or other communication networks. The bank first transfers the cash value of the check to the check account and then cancels the check or returns it electronically to the check recipient as proof that the check has actually been cashed. The check recipient can also verify electronically that the amount has actually been transferred to their account (Radwan, 2003, p. 89)

1. The Impact of Electronic Payment Methods on the Functions of Central Banks in Managing Monetary Policy

This topic has been divided into two parts. The first part is devoted to the concept of monetary policy, while the second part examines the impact of electronic payment methods on central banks' functions in managing monetary policy.

3.1 concept of monetary policy

There are many definitions of monetary policy across schools of thought. It is one of the two parts of economic policy and plays an effective role in regulating the money supply. Perhaps one of the most important pioneers who addressed this economic idea was the American Keynes.

It is a set of measures and provisions followed by the state to influence and control credit in pursuit of economic policy objectives (Ali, 2004, p. 112)

- Monetary policy is the set of measures used by the central bank to influence the money supply in some way to achieve a set of economic objectives.
- Monetary policy refers to the set of texts, laws, and measures taken by the monetary authority to influence the money supply through expansion or contraction to achieve economic objectives (Mandour, 2003-2004, p. 62)

From the above, we can briefly define monetary policy as the measures and laws adopted by the financial authority to control the money supply to achieve economic stability (Qadi, 2003, p. 53).

3.2 The impact of electronic payment methods on the functions of the central bank

3.2.1 The impact of electronic money on the central bank as a monetary issuer: The reasons for concentrating the task of issuing currency in the hands of the central bank are the importance of standardizing the banknotes in circulation within the country and avoiding the risks of excessive issuance by traditional banks operating within the country, as well as avoiding the dangers of excessive issuance by commercial banks to increase their profits, even if this leads to damage to monetary stability. Given the central bank's legal monopoly on issuing currency, advanced information and communications technology has provided an alternative to paper money (banknotes): electronic money, one of the most essential electronic payment methods. Despite several years having passed since the introduction and use of electronic funds, traditional money still prevails in transaction settlement, especially in developing countries. It can be said that the central bank's monopoly over the issuance of money is significantly affected by the private sector's entry into electronic money issuance. Still, the degree of influence depends mainly on the following:

- If the central bank has a monopoly on the issuance of electronic money, it will retain its function of issuing money, but in a form other than banknotes.
- If demand deposits are used as full or partial reserves for issuing electronic money and there is a joint payment system combining traditional cash and electronic money, the central bank's function as a source of conventional funds will be affected, as will be the case if demand deposits are not used.
- If demand deposits are not used as a whole or partial reserve for issuing electronic money and there is a new payment system dominated by electronic money, the central bank's function as a source of traditional funds will be eliminated.

3.2.2 The impact of electronic payment methods on the central bank as the bank of banks (the lender of last resort)

The central bank performs its function as a bank of banks by carrying out various tasks on behalf of commercial banks to supervise and maintain banking stability. Its function as a bank of banks consists of four main tasks: holding cash reserves, conducting interbank clearing, supervising and regulating banks, and acting as the lender of last resort, all of which are carried out using traditional payment methods. However, if we consider the impact of electronic payment methods, particularly electronic money, there is undoubtedly a significant effect on the central bank's role as the bank of banks.

With the spread of electronic money and financial globalization, the central bank's ability to perform this function will be affected, and the extent of the impact will depend on the degree to which current money serves as a basis for issuing electronic money. If it is used

solely for transactions, the central bank can control the size of its reserves and thus continue to perform this function. However, if it is not used, the central bank's reserves will be affected, making it difficult to perform this function. The spread of electronic payment methods also affects the central bank's ability to act as a lender of last resort, depending on the cash reserve ratio. If it holds any cash reserves, it will not be able to perform this function, especially with the entry of institutions other than banks.

The central bank's ability to settle cash reserves between banks also depends on the fact that there are many cases in which clearing between banks can be carried out, such as the following:

Bilateral electronic settlements between banks without the need to refer to the central bank, as it is possible to conduct all transactions electronically, with the central authority unable to monitor these movements.

The existence of some special bodies to carry out clearing between banks.

3.3 Economists' views on the impact of electronic payment methods on monetary policy

The expansion of electronic money transactions will affect the volume of legal tender transactions, potentially altering the central bank's monetary policy management by influencing its instruments. We will first present economists' views on the impact of electronic money on economic policy, and then on its impact on monetary policy instruments.

3.3.1 Economists' positions on the potential effects of the spread of electronic money on monetary policy

We distinguish between three positions, which are as follows:

– **First position** (al-Din, 2001, pp. 83-84): **Electronic money fundamentally changes the effectiveness of monetary policy**

George Selgin believes that replacing legal tender with electronic money will increase the effectiveness of monetary policy by reducing the variance of the money multiplier attributable to changes in aggregate demand for currency.

He believes that the development of electronic money, especially stored-value cards, will support the hope that the public will one day no longer be a hostage to the central bank. In principle, electronic money will replace legal tender issued by the central bank and circulated domestically. In this case, the legal tender held by the government will be completely privatized, and the role of the central bank will be limited to securing the source bank reserve.

W. Niskanen says that the above conclusion depends on the validity of two assumptions. The first is that electronic money will grow to the point of substantially reducing demand for legal tender. And the second is that monetary policy will be better managed by controlling specific amounts of money for which the central bank is responsible. Both assumptions are highly questionable, as it is unlikely that electronic money will replace legal tender in a significant and effective manner; therefore, no fundamental change in the money multiplier is expected.

– **The second position: Electronic money has no impact on monetary policy** (Al-Nasharti, 2003, pp. 85-86)

This position is expressed by Bert Ely, who believes that the replacement of legal tender with electronic money will not affect monetary policy. The only significant impact may be the loss of seigniorage income to the government. Ely presents two arguments to support this view:

First: The expected size of the stored-value card market will not exceed US\$10 billion, and the resulting income (which is equal to the government's loss) will be around US\$600 million, which will not be sufficient to cover the private sector's costs of issuing, marketing, and developing these cards. In this case, there will be no significant impact on currency demand.

Second, the central bank does not shy away from supplying money for two reasons. First, the central bank provides the amount of currency people want to hold, and second, it gives the banking system the reserves it needs to meet legal reserve requirements.

Thus, monetary policy today consists entirely of interest rate signals sent by the central bank to the financial system; therefore, the potential spread of electronic money will have no significant impact on monetary policy.

However, this conclusion is viewed with caution by economists because it presents a particular view of the central bank's role

– **The third position: The spread of electronic money may reduce the role of central banks in issuing money, but it will not threaten their role in managing monetary policy.**

This position is essentially a middle ground between the two previous positions, and is expressed by J. Geordan and E. Stevens. It can be summarized as follows:

- Developments in forms of money in the past have led to a reduction in demand for central bank money (legal tender), and developments in electronic money are likely to reduce demand for such money further. However, it is still too early to ascertain the extent of the change in demand. Therefore, the expected effects of the spread of electronic money on monetary policy remain uncertain.

- Monetary authorities will continue to determine the price level as long as the final settlement of taxes and other debts and obligations is made using central bank liabilities.

- Even with a decline in demand for central bank liabilities, central banks will remain the sole source of national currency units needed to settle tax liabilities as well as final settlements between competing private sector institutions issuing electronic money. Settlement and monetary policy functions performed by central banks will continue in the 21st century, even in the absence of traditional demand for legal tender.

The researchers conclude that the spread of electronic money will likely lead to a reduction, and possibly the disappearance, of the role of central banks in issuing legal tender, but will not lead to the disappearance of their role in conducting monetary policy and settling obligations arising from taxation or transactions between institutions issuing electronic money.

3.3.2 The impact of electronic payment methods on monetary policy instruments

We will examine the impact of electronic money and electronic payment instruments on monetary policy by examining their effects on the quantitative instruments a central bank can use to influence aggregate demand and the volume of the money supply.

– The impact of electronic money and electronic payment methods on open market policy

Open market policy is based on the central bank's intervention in the purchase and sale of private and government securities in the money market to reduce or expand the volume of liquid funds or cash reserves held by commercial banks, i.e., to influence their ability to create credit, depending on the economic conditions of the country.

In terms of the impact of electronic payment methods and electronic money on open market policy, this impact depends mainly on the extent to which these methods are used. The less they are used, the weaker their effect on the effectiveness of the central bank's open market operations. Conversely, the widespread use of these means as an alternative to traditional money may affect the central bank's ability to conduct open-market operations. The widespread use of electronic funds is gradually pushing them to abandon the requirement to retain legal tender. This would result in commercial banks returning more than their required reserves to the central bank, thereby increasing the central bank's cash reserves. An increase in the central bank's cash reserves would limit its ability to sell securities and withdraw liquidity from commercial banks, thereby affecting their ability to grant credit. If central banks wish to extend credit by purchasing securities from individuals, individuals will use electronic money to buy those securities. However, since there is no link between electronic money and any balances they hold with commercial banks, this process will not affect those banks' credit policy. This, in turn, will limit the central bank's ability to use this policy and influence the amount of credit granted by banks.

– The impact of electronic payment methods on the legal reserve ratio

The central bank requires commercial banks to maintain a certain percentage of their deposits with the central bank as a legal cash reserve in the form of a credit balance, whereby the central bank can control the ability of commercial banks to grant loans through this means and change its ratio up or down depending on the economic situation. The shift towards electronic means means dispensing with traditional cash in favor of electronic money, thereby increasing the size of the reserve. This will increase commercial banks' liquidity and reduce the demand for central bank reserves. In other words, the widespread use of electronic money and the absence of reserve requirements for it will limit the effectiveness of the reserve policy, as commercial banks will have a surplus of deposits, and their liquidity will increase significantly.

– The impact of electronic payment methods on the rediscount rate

The rediscount rate, also known as the bank rate, is the interest rate charged by the central bank for rediscounting securities to commercial banks. Individuals can purchase electronic money in exchange for legal tender, and in both cases, this money will enter the banks' coffers. Because the issuers of electronic money will deposit the legal tender they receive in exchange for electronic money into their bank accounts, and the banks will

exchange the money for deposits with the central bank. In this way, commercial banks' reserves will exceed the desired amount. It can be said that the emergence of electronic money has increased commercial bank reserves. Therefore, the rediscount rate will not have a significant impact on controlling credit volume. This is because banks' demand for rediscounting commercial paper with the central bank will decrease as their cash liquidity increases and they need the central bank less. Therefore, regardless of changes in the rediscount rate, it will not affect the volume of credit because there is no demand for rediscounting commercial paper.

– **The impact of electronic payment methods on interest rates**

Lending and borrowing interest rates and discount rates are among the most effective monetary and credit policy tools for influencing the money supply, as they have a clear impact on the volume of savings on the one hand and the volume of credit granted by commercial banks on the other (newsletter, 2003, p. 113) The central bank's ability to control interest rates depends on the method used to create electronic money. Individuals can purchase electronic cash in exchange for legal tender or their deposits, and cardholders can increase their credit or debit balances. In both cases, this (legal) money will enter the coffers of the banks (issuers of legal tender), which will deposit it in their accounts with the central bank or other banks. In other words, banks will use the money to create deposits with the central bank, thereby increasing them beyond the desired level. In this case, commercial banks will choose between two options: either purchase assets from non-bank institutions and grant more loans, or buy more assets from the central bank. The demand for assets in financial markets and the granting of more loans will lead to a decrease in interest rates, as the supply of liquidity increases relative to demand; therefore, banks will choose the second option (Al-Shafei, 2003, pp. 10-11)

In cases where electronic money is issued by banks and financial and credit institutions subject to strict central bank supervision, with a commitment to legal coverage for the issued money, the central bank retains its ability to control interest rates. However, if issuance is carried out by non-banking, non-financial institutions subject to less stringent central bank supervision, and if they issue more electronic money without legal backing, it becomes difficult for the central bank to control interest rates (Sadek, 2012, p. 323)

The European Union report issued in 1494 required banks to specialize in issuing electronic money, whereas the US system did not include such a restriction. Thus, each country must establish regulatory frameworks to address this money in line with its economic situation and build confidence among those who deal with it. At the same time, banks should be encouraged to offer it in markets, enabling customers to access legal cover and fostering a spirit of competition and innovation among banks.

2. **The impact of electronic payment methods on monetary policy in Algeria**

With the rise in technological and international competition for the use of digital methods, electronic payment methods, in general, and electronic money in particular, have spread for concluding transactions, and Algeria needed to enter the race and take advantage of the benefits these methods offer. However, in our society, the use of electronic money is uncommon and much less prevalent than in developed countries, including the Gulf countries and neighboring countries such as Morocco and Tunisia. Its use is limited to banks, other financial institutions, and some large stores only. As for other electronic

payment methods, they are somewhat widespread among the general public. In this section, we will discuss the extent of electronic money use in Algeria and whether it affects the Bank of Algeria's monetary policy.

4.1 The development of electronic payment methods in Algeria

Since most stages of e-commerce - from product search to negotiation and contracting - take place in a virtual space, the next stage of this trade, namely the electronic settlement of payments, had to be completed. This required banks to provide technologies and issue electronic payment methods compatible with this modern type of electronic transaction

4.1.1 Establishment of the Company for the Automation of Banking and Cash Transactions and the Banking Cash Network (SATIM)

The first step taken by the banking system to modernize and develop was the establishment of the Joint Banking and Cash Transactions Company in 1995, a joint-stock company with eight member banks. This company seeks to modernize banks and upgrade cash transactions between them. In addition to issuing bank cards and processing all related transactions, given that the means of payment in the Algerian banking system are traditional, SATIM's keenness to develop these systems and ensure smooth interbank operations prompted it to establish a joint cash network linking several banks. In 1997, the first step of this project was completed, and the network, Réseau Monétiqueinterbancaire, was launched, providing services for the issuance of bank cards for ATM withdrawals.

The connection of these ATMs to the interbank network enabled cardholders to withdraw cash from any ATM, even if the card-issuing bank did not own it. This was made possible by SATIM, which ensured all banks accepted the card in the cash network and that interbank withdrawals were cleared.

4.1.2 ATMs

One of the most essential conditions for the success of any automated cash system is the availability of a sufficient number of ATMs and their widespread distribution, which facilitates the use of bank cards anywhere and at any time. ATMs were first introduced in Algeria in 1997. The following table shows the number of ATMs in Algeria:

Table 1: Total number of interbank ATMs operating in Algeria

Year	Total number of ATMs in operation in Algeria
2022	3640
2023	3848
2024	3942
Oct 2025	4622

Source: (MONETIQUE, 2025, p. 5)

We note from the previous table the development of the number of ATMs, which totaled approximately 1,441 in 2022, with the total number of ATMs operated by SATIM reaching 3,030 in January 2023 across the entire country, which indicates the widespread use of these machines and will require further development at the level of bank cards.

4.1.3 Electronic payment terminals

SATIM has installed payment terminals, known as TPEs, in shops and other locations that

accept them. These are pretty large magnetic card readers.

The TPE devices, which comply with EMV Eurocard Visa Mastercard Level 1 and Level 2 standards, are equipped with EMV chip readers

and ISO (Organization Internationale de Normalization) chip readers. The application on these devices is an interbank application certified by ISO, with SATIM as the entity authorized to operate them in Algeria. **The following table shows the number of electronic payment terminals in Algeria.**

Table 2: The number of electronic payment terminals in Algeria

Year	Total number of payment terminals in operation in Algeria
2022	46,263
2023	53,191
2024	68,140
O2025	77,494

Source: (MONETIQUE, 2025, p. 7)

4.1.4 Electronic cards

An electronic card is defined as a contract between the card issuer, which is often a credit institution, and a person called the cardholder. Under this contract, the issuer undertakes to place at the cardholder's disposal a credit line up to a certain amount, which can be used to pay for purchases at shops that are also bound by a contract with the issuer, whereby the latter agrees to accept payment by card for a specific period of time (Al-Qilubi, July 2004., p. 82)

In Algeria, the banking system was forced to make more efforts in the field of cards, so the bank card withdrawal project was replaced by another new project, the CIB interbank withdrawal and payment card, which performs a dual function: withdrawing money from ATMs and paying for purchases and services at electronic payment terminals at merchants participating in the system. The card bears the issuing bank's logo and the interbank card logo, and has an electronic chip that complies with.

Visa and Mastercard's international standards, enabling payment transactions. SATIM began a project to launch an interbank payment system in 2002, but the actual launch of this project was delayed and did not bear fruit until 2006, after it was tested for six months in 2005 on several merchants (200-500 merchants). In 2007, the CIB card was rolled out nationwide (Dimash, 2011, p. 15). By the end of July 2019, 22. Million bank payment cards had been issued, with more than 21,000 electronic payment terminals and 32 e-commerce sites licensed, compared to 122,000 direct electronic payments and 90,000 online sales, according to the Automated Teller Machine Control Authority. The following table provides further details:

Table 3: Total debit and credit card withdrawal and payment activity

Year	Total number of electronic payment transactions	Total number of electronic withdrawal transactions
2022	2712848	19,764,988
2023	3,997,165	18571241
2024	5579708	197323075
Oct 2025	903301	20225732

Source: (MONETIQUE, ATM withdrawal activity, 2025, p. 10)

The Interoperability Agreement signed on 5 January 2020 between the Algerian Post Office and SATIM, a company specializing in interbank automated transactions, has contributed to the implementation of electronic payment and withdrawal operations, allowing gold card and bank card holders to benefit from the cash services provided by the automated dispensers of the postal and banking networks in an integrated manner and in compliance with the required safety and efficiency standards. It should also be noted that the public authorities have adopted measures to encourage the use of electronic payment and withdrawal operations in accordance with the required safety and efficiency standards, and that banks have done so in an integrated manner, in accordance with the necessary safety and efficiency standards. It should also be noted that public authorities have adopted measures to encourage electronic payments, which will help reduce cash circulation, particularly in the context of the COVID-19 pandemic.

4.2 Monetary policy in Algeria during the period 2015-2018

In this section, we review the development of the most essential aggregates in the monetary sector in 2018, including external and public accounts. It also focuses on the impact of the widespread use of unconventional financing on the banking sector, alongside changes in monetary policy management.

4.2.1 Key monetary developments

After two years of relative stability (2015 and 2016), the M2 money supply grew by 4.8% in 2017 and 11.1% in 2018. As in 2017, this increase in monetary balances was due to the substantial rise in demand deposits at banks, which rose by 19.0% (5.20% in 2017), compared with 11.1% for time deposits and 5.4% for paper money circulation.

However, as was also the case in 2017, the substantial increase in bank demand deposits - by approximately 68% - is attributable to the rise in the National Hydrocarbons Company's demand deposits, which benefited in 2018 from the repayment of part of its debts to the Treasury (452 billion dinars). Thus, excluding deposits from the hydrocarbons sector, monetary expansion amounted to only 7.7% (Algeria, 2019, p. 133).

The substantial increase in demand deposits at banks (including the Bank of Algeria) was reflected in an increase in the M1 money supply of approximately 11.1% compared to 1.9% in 2017, which still represents 5.68% of the money supply, despite a decline in the share of paper money in circulation from 31.5% in 2017 to 29.6% in 2018.

4.2.2 Monetary indicators

From the perspective of M2 monetary aggregate interviews, the consolidated financial position of the banking system as a whole appears to be.

- **net foreign assets** (foreign exchange reserves expressed in dinars) declined by 15.5% in 2018 (compared to 10.9% last year, representing a decline of 1,741.8 billion dinars). This decline, slightly lower than the decline in net negative flows of the total balance of payments (equivalent to 15.82 billion dinars), can be explained by the fact that net loans to the state rose again by 34.8%, from 4,691.9 billion dinars at the end of 2017 to 5,035.7 billion dinars at the end of 2018.

- **Net loans to the state** rose again by 34.8%, from 4,691.9 billion dinars at the end of 2017 to 6,325.7 billion dinars at the end of 2018, due to the increase in the Bank of Algeria's receivables from the public treasury, which rose from 1,967.4 billion dinars at the end of 2017 to 3,857.8 billion dinars at the end of 2018, despite a decrease in

commercial banks' receivables from the state (-19.3%). The increase in the Bank of Algeria's net receivables from the public treasury resulted from the direct purchase of treasury bonds within the framework of monetary financing, amounting to 3,371.2 billion dinars, pursuant to Article 45 bis of Decree No. 03-11 on currency and credit.

Loans to the economy, excluding the repurchase of non-performing receivables, increased by 12.4% in 2018, compared to 12.3% in 2017, reaching 9,976.3 billion dinars (Algeria, 2019, p. 135)

4.2.3 Money supply interviews

As was the case in 2015, 2016, and 2017, in the development of the M_2 , it is the banking system's loans to the state, particularly those granted by the Bank of Algeria, that contribute most to the growth of monetary expansion (M_2). Indeed, in a context characterized by a decline in negative flows of foreign exchange reserves, linked to a deficit in the overall balance of payments of approximately (1,845 billion dinars of contraction in monetary reserves), the flows of loans to the state from the banking sector, estimated at 1,633.8 billion dinars, of which 1,890.4 billion dinars relate to the Bank of Algeria, explain the increase in the money supply M_2 by 1,662.1 billion dinars in 2018, with an increase in loan flows to the economy of 1,096.3 billion dinars.

4.3 The development of monetary policy in Algeria in light of the adoption of electronic payment systems

The development of the Algerian banking system is linked to the development of banking services in general, and the payment system in particular. The development of the latter requires the provision of elements related to technical infrastructure and to the Algerian banking system. For this reason, the Algerian authorities have developed national projects, including an instant gross settlement system and the establishment of electronic clearing

4.3.1 Real-time gross settlement (RTGS) system: The real-time gross settlement system is the clearest example of real-time gross settlement, providing immediate and final settlement as soon as the payment order is received, provided that sufficient funds are available in the sending bank's account. Practical experience shows that transactions are not settled in real time and that the settlement period is long due to the bankruptcy of one of the parties during the process, before completion. Furthermore, delays and the accumulation of transactions at one of the parties affect the speed of the financial system's performance and increase the likelihood that the entire national economy will be exposed to greater risks in the event of the bankruptcy of a financial institution with accumulated transactions (Al-Hamada, 2018, pp. 36-38)

In Algeria, during 2018, which included 252 working days, the instant gross settlement system for large amounts and urgent payments "ARTS" system processed 360,919 transactions, with a total amount of 101,621.428 billion dinars, compared to 329,227 transactions with an amount of 99,896.266 billion dinars in 2017, an increase in volume of 6.39% and a growth of 1.73% in terms of value. This increase in negotiated values can be explained, in particular, by the significant rise in transactions on government values during 2018, reaching a total of 5987.830 billion dinars, an increase of 55.67% compared to 2017.

In terms of volume, interbank transfers accounted for 70.70% of total transactions, followed by central bank transactions at 27.60%, and finally external system balances at 1.70%. In terms of value, central bank transactions dominated, accounting for 72.02% of the total amount of transfers processed by the system —equivalent to approximately three-quarters of the total —and bank-to-bank transactions and external system balances accounted for 17.88% and 10.10%, respectively (Algeria B. , 2019, p. 135)

4.3.2 Electronic clearing system "ATCI": As part of the modernization of the payment system in Algeria, the ATCI electronic clearing system was created for small and medium-sized amounts, i.e., transfers of less than 1,000,000 DZD, as well as checks using the standard form between banks. It has been in operation since 15 May 2006. It should be noted that the RTGS and ATCI systems are interconnected to ensure the settlement of multiple balances for participants.

As for the electronic clearing system for payments to the general public, during 2018, which saw 251 trading days, the electronic clearing system for payments to the general public processed 25.030 million transactions, worth 17,016.830 billion dinars, compared to 22.946 million transactions, worth 18,753.752 billion dinars in 2017, representing an increase of 8.32% in terms of volume and a decrease of 1020.% in terms of value.

In 2018, the system processed an average daily volume of 99,721 transactions, totaling 67.796 billion dinars, compared to 91,419 transactions totaling 74.716 billion dinars in 2017.

4.4 Results

From the above, it is clear that monetary policy in Algeria is managed by the Central Bank, which is the sole administrator of such policy. It changes with the country's economic, social, and political situation. However, after studying the issue, we have not reached a clear conclusion on the extent of the impact of electronic payment methods on monetary policy in Algeria. The reason for this ambiguity or lack of impact of electronic payment methods on monetary policy in the Algerian banking system as a whole may be the scarcity of these methods and channels within the country, as well as the absence of explicit legal protections for electronic transactions. Despite the widespread use and remarkable development of electronic payment methods and electronic money, and the growth in payments via electronic cards, they still fall short of the required level. The most obvious example is that Algerian citizens still prefer paper money and do not trust traditional direct transactions, fearing the drawbacks of modern electronic means.

3. Conclusion

This study has shown that the impact of electronic payment methods on monetary policy depends on their degree of adoption and use, as well as on the extent to which individuals trust and accept them. As for the potential effects of electronic payment methods on monetary policy, we find, from a theoretical perspective, several effects, most of which center on the impact on the central bank's most important function: money issuance and the increase in the money supply within the state. In reality, however, and based on the Algerian banking sector, we have not reached any clear conclusion regarding

the extent of the impact of electronic payment methods on monetary policy in Algeria, given the scarcity of these methods and channels within the country, in addition to the absence of clear legal legislation protecting electronic transactions.

4. References

- Alaa Al-Hamami, G. A.-S. (2016). *Information Technology Applications in Advanced Electronic Business*. Jordan: Dar Wael Publishing and Distribution.
- al-Din, M. J. (2001). Electronic money and its impact on the role of central banks in managing monetary policy. *Journal of Legal and Economic Research* .
- Alexandria, B. o. (2001). *Electronic Payment Methods and Systems*. Alexandria: Economic Bulletin.
- Algeria, B. (2019). Annual Report 2018: Economic and Monetary Development in Algeria.
- Algeria, B. o. (2019). *Economic and Monetary Development in Algeria, , December . .* Annual Report 2018.
- Algeria, B. o. (2019). Economic and Monetary Development in Algeria: Annual Report 2018.
- Al-Hamada, H. M. (2018). *Contractual Relationships Arising from Electronic Payment Cards*. Cairo: Arab Center for Publishing and Distribution.
- Ali, B. B. (2004). *Lectures on Monetary Theory and Policy 2004*. Algeria: University Publications Office.
- Al-Khazraji, T. A. (2019). *Journal of Economics, Management, and Sciences* .
- Al-Khazraji, T. A. (2019). The Impact of Electronic Payment Systems on the Effectiveness of Monetary Policy. – *Journal of Economics, Management, and Sciences* , 137.
- Al-Khazraji, T. A. (2019). The Impact of Electronic Payment Systems on the Effectiveness of Monetary Policy. *Journal of Economics, Management, and Sciences* .
- Al-Nasharti, M. (2003). *Monetary and Banking Policies*. Cairo: Dar Al-Nahda Al-Arabiya.
- Al-Qilubi, S. (2004.). *Electronic Payment and Modern Means of Payment* . Arab Arbitration Magazine.
- Al-Qilubi, S. (July 2004.). *Electronic Payment and Modern Means of Payment* .
- Al-Shafei, M. I. (2003). *Monetary Economic, and Financial Effects of Electronic Money*.,
- Al-Zaydi, W. (2004). *E-commerce via the Internet*. Jordan: Legal Position.
- Bassiouni, A. H. (2004). 14. , *Fundamentals and Principles of E-Commerce*. Cairo: Dar Al-Kotob Al-Ilmiya Publishing and Distribution.
- Dimash, S. (2011). 23. *E-commerce: Its Inevitability and Reality in Algeria*. Algeria: University of Constantine.
- GIE MONETIQUE .(2025) .*ATM withdrawal activity* .
- GIE MONETIQUE.(2025) .
- Herif, M. H. (2000). *"La monnaie électronique"*. Paris: Éditions Roolles.
- Hussein, a. (2007). *Electronic liability*. Cairo, 102-103: New University House.
- Mandour, A. M. (2003-2004). *Introduction to Macroeconomic Theory*. Egypt: University Press.
- Mohammed, T. (2015). *Requirements for the Development of Electronic Banking Transactions in Arab Countries with Reference to the Case of Algeria*. Algeria.: University of Chlef,.

- MONETIQUE, G. (2025). *ATM withdrawal activity*.
- Nazem Muhammad Nouri al-Shimari, A. a.-F. (2008). *Electronic Banking*. Amman: Dar Wael Publishing.
- newsletter, M. (2003). *Monetary and banking policies*.
- Qadi, A. (2003). *Introduction to Macroeconomic Policies*. University Publications Office.
- Radwan, R. (2003). *Basic Principles of Marketing and E-Commerce*. Cairo: Arabesque Graphica.
- Sadek, H. E.-D. (2012). Ain Shams University.: *Scientific Journal of Economics and Commerce*.
- Sadek, H. E.-D. (2019). *Scientific Journal of Economics and Commerce, Faculty of Commerce*.
- Sadek, H. E.-D. (2012). *Electronic Payment Methods and Their Impact on Monetary Policy*.
- Shafiq, W. (2020). Civil and Criminal Liability in Credit Cards. *United Legal Publications, Library of the Egyptian General Insurance Union*.
- Shaheen, A. A. (s.d.). Electronic Payment Systems, Their Risks and Means of Control: An Applied Study on the Bank of Palestine. *Al-Azhar University Journal in Gaza ,Humanities Series Vol. 12, No. 1*.
- Sharif Mohamed Ghanam. (2003, May 10-12). Electronic Money Wallet: A Vision for the Future. *Conference on Electronic Banking between Sharia and Law, College of Sharia and Law, United Arab Emirates University*.